

WHAT IS CLAIMED IS:

1. A laminate comprising:

a first bonding sheet having a major surface and a peripheral edge, said first bonding sheet being suitable for bonding to a glazing component having a major surface and a peripheral edge; and

10 a transparent optical sheet comprising a non-metallic multi-layer optical film, said optical sheet having a major surface and a peripheral edge, said optical film having a peripheral edge, and the major surface of said optical sheet and the major surface of said first bonding sheet being positioned together,

wherein said optical film is dimensioned so as to be positionable substantially within the peripheral edge of the glazing component to which said optical sheet is to be adhered.

15 2. The laminate of Claim 1 wherein said optical film is dimensioned so as to be positionable completely within the peripheral edge of the glazing component to which said optical sheet is to be adhered.

20 3. The laminate of Claim 1 wherein the major surface of said optical sheet and the major surface of said first bonding sheet are at least partially bonded together such that a substantial portion of the peripheral edge of said optical film lies within the peripheral edge of said first bonding sheet.

25 4. The laminate of Claim 1 wherein said optical sheet has another major surface and said laminate further comprises a second bonding sheet, said second bonding sheet having a major surface that is positioned relative to the other major surface of said optical sheet such that said optical sheet is disposed between said first bonding sheet and said second bonding sheet.

30 5. The laminate of Claim 4 wherein the major surface of said second bonding sheet and the other major surface of said optical sheet are at least partially bonded together.

6. The laminate of Claim 5 wherein said optical film lies completely within the peripheral edge of at least one of said first bonding sheet and said second bonding sheet.

5 7. The laminate of Claim 4 wherein at least one of said first bonding sheet and said second bonding sheet comprises a material selected from the group consisting of polyvinyl butyral, polyurethane, ionoplast and combinations thereof.

10 8. The laminate of Claim 4 further comprising two transparent glazing components, each of said glazing components having a major surface and a peripheral edge, wherein each of said first bonding sheet and said second bonding sheet has another major surface that faces the major surface of one or the other of said glazing components such that said optical sheet is disposed between said first and second bonding sheets and said first and second bonding sheets are disposed between said glazing components such that the peripheral edge of said optical film is positioned substantially within the peripheral edge of at least one of said glazing components.

15 9. The laminate of Claim 8 wherein said optical film is positioned completely within the peripheral edge of each of said glazing components.

20 10. The laminate of Claim 8 wherein each of said first and second bonding sheets is fully bonded to its respective glazing component and said optical sheet.

25 11. The laminate of Claim 8 wherein each of said first and second bonding sheets is bonded to its respective glazing component and said optical sheet, and at least one of said first and second bonding sheets is bonded to the peripheral edge of said optical sheet such that there are substantially no voids present adjacent the peripheral edge of said optical sheet.

30 12. The laminate of Claim 1 wherein the major surface of said optical sheet and the major surface of said first bonding sheet are at least partially bonded together such that a substantial portion of the peripheral edge of said optical film lies within the peripheral edge of said first bonding sheet, said laminate further comprises a transparent peripheral

strip comprising non-metallic multi-layer optical film that once formed an outer peripheral portion of said optical sheet, said peripheral strip having a width and an inner peripheral edge, said peripheral strip being disposed beyond the peripheral edge of said optical sheet, and the inner peripheral edge of said peripheral strip and the peripheral edge of said optical sheet defining a slit therebetween.

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13. The laminate of Claim 12 wherein said optical sheet has another major surface, said laminate further comprises a second bonding sheet having a major surface at least partially bonded to the other major surface of said optical sheet such that said optical sheet is disposed between said first bonding sheet and said second bonding sheet.

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14. The laminate of Claim 13 wherein said slit goes through said optical sheet and through one of said first bonding sheet and said second bonding sheet.

15 15. The laminate of Claim 13 further comprising two transparent glazing components, each of said glazing components having a major surface and a peripheral edge, wherein each of said first bonding sheet and said second bonding sheet has another major surface that faces the major surface of one or the other of said glazing components such that said optical sheet and said peripheral strip are disposed between said first and second bonding sheets and said first and second bonding sheets are disposed between said glazing components.

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16. The laminate of Claim 15 wherein each of said first and second bonding sheets is fully bonded to its respective glazing component and said optical sheet.

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17. The laminate of Claim 1 wherein the peripheral edge of said optical film is a first peripheral edge and said optical film has a second peripheral edge located within the confines of the first peripheral edge.

30 18. A laminate comprising:

two bonding sheets, each bonding sheet having two major surfaces and a peripheral edge and being suitable for bonding to a transparent glazing component; and

a transparent optical sheet comprising a non-metallic multi-layer optical film, said optical sheet having two major surfaces and a peripheral edge, said optical film having a peripheral edge, one major surface of said optical sheet being positioned adjacent to the other major surface of each of said bonding sheets such that said optical sheet is disposed between said bonding sheets and said bonding sheets are bondable between two glazing components,

said optical film is dimensioned so that its peripheral edge is positionable so as to extend substantially beyond the peripheral edge of at least one of the glazing components between which said optical sheet is to be adhered.

10 19. The laminate of claim 18 further comprising two transparent glazing components, each glazing component having a major surface and a peripheral edge, wherein one major surface of one of said bonding sheets is bonded to the major surface of each of said glazing components, such that at least a substantial portion of the peripheral edge of said optical film is disposed so as to extend beyond the peripheral edge of at least one of said glazing components.

15 20. The laminate of Claim 19 wherein most of the peripheral edge of said optical film is disposed so as to extend beyond the peripheral edge of at least one of said glazing components.

20 21. The laminate of Claim 19 wherein all of the peripheral edge of said optical film extends beyond the peripheral edge of both of said glazing components.

25 22. The laminate of Claim 19 wherein a portion of the peripheral edge of said optical film lies within the peripheral edge of at least one of said glazing components.

23. A method of making a laminate for use in a window structure comprising:
30 providing a first bonding sheet and a transparent optical sheet, each having two major surfaces and a peripheral edge, the transparent optical sheet comprising a non-metallic multi-layer optical film having a peripheral edge, and the first bonding sheet

being suitable for bonding to the optical sheet and to a glazing component having a major surface and a peripheral edge;

dimensioning the optical sheet such that a substantial portion of the peripheral edge of the optical film can be positioned at least substantially within the peripheral edge of a glazing component to which the first bonding sheet is to be adhered;

5 positioning together one major surface of the optical sheet so as to face one major surface of the first bonding sheet.

24. The method of Claim 23 wherein said dimensioning comprises precisely
10 trimming a peripheral portion of a pre-dimensioned transparent optical sheet to form the peripheral edge of the optical sheet so as to substantially limit the formation of sites for subsequent delamination of the multi-layer optical film along the peripheral edge of the optical film.

15 25. The method of Claim 23 wherein said dimensioning comprises precisely trimming and removing a peripheral portion of a pre-dimensioned transparent optical sheet, after said positioning together, to form the peripheral edge of the optical sheet so as to substantially limit the formation of sites for subsequent delamination of the optical film along the peripheral edge of the optical film and so as to expose an
20 underlying peripheral portion of the first bonding sheet.

26. The method of Claim 23 wherein said dimensioning comprises dimensioning the optical sheet such that the peripheral edge of the optical film is positionable at least completely within the peripheral edge of a glazing component to which the first bonding
25 sheet is to be adhered.

27. The method of Claim 23 further comprising:

30 at least partially bonding together the one major surface of the optical sheet and the one major surface of the first bonding sheet such that at least a substantial portion of the peripheral edge of the optical film lies within the peripheral edge of the first bonding sheet.

28. The method of Claim 23 further comprising:
providing a second bonding sheet having two major surfaces and a peripheral edge
and being suitable for bonding to the optical sheet and a glazing component;
positioning together the other major surface of the optical sheet and one major
surface of the second bonding sheet such that the optical sheet is disposed between the
first and second bonding sheets.
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29. The method of Claim 28 further comprising:
at least partially bonding together the other major surface of the optical sheet
and the one major surface of the second bonding sheet such that the optical sheet is
disposed between the first and second bonding sheets,
wherein at least a substantial portion of the peripheral edge of the optical film lies
within the peripheral edge of at least one of the first and second bonding sheets
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30. The method of Claim 28 further comprising:
providing two transparent glazing components, each having a major surface and
a peripheral edge;
positioning together the other major surface of the first bonding sheet and the
major surface of one of the glazing components and positioning together the other major
surface of the second bonding sheet and the major surface of the other one of the glazing
components, such that the first and second bonding sheets are disposed between the
glazing components; and
positioning the optical sheet such that at least a substantial portion of the
peripheral edge of the optical film lies within the peripheral edge of at least one of the
25 glazing components.
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31. The method of Claim 30 further comprising:
at least partially bonding together the one major surface of the optical sheet and
the one major surface of the first bonding sheet, at least partially bonding together the
other major surface of the optical sheet and the one major surface of the second
bonding sheet, at least partially bonding together the other major surface of the first
bonding sheet and the major surface of the one glazing component, and at least partially
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bonding together the other major surface of the second bonding sheet and the major surface of the other glazing component,

wherein the optical sheet is bonded between the first and second bonding sheets and the first and second bonding sheets are bonded between the glazing components.

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32. The method of Claim 30 wherein said positioning of the optical sheet comprises positioning the peripheral edge of the optical film completely within the peripheral edge of at least one of the glazing components by a distance.

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33. The method of Claim 30 further comprising:

applying at least heat to the laminate for a sufficient time to allow the major surfaces of the first and second bonding sheets to flow and sufficiently bond to the respective major surfaces of the optical sheet and the glazing components.

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34. The method of Claim 30 further comprising:

applying heat and pressure for a sufficient time to allow the major surfaces of the first and second bonding sheets to flow and sufficiently bond to the respective major surfaces of the optical sheet and the glazing components.

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35. The method of Claim 27 wherein the optical sheet being provided forms part of a pre-dimensioned transparent optical sheet, said dimensioning is performed after said at least partially bonding together, said dimensioning comprises trimming a peripheral strip of at least non-metallic multi-layer optical film of the pre-dimensioned optical sheet so as to form the optical sheet, the peripheral strip having a width and an inner peripheral edge, the peripheral strip being disposed beyond the peripheral edge of the optical film, and the inner peripheral edge of the peripheral strip and the peripheral edge of the optical film defining a slit therebetween.

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36. The method of Claim 35 wherein the optical sheet being provided has another major surface, said method further comprises:

providing a second bonding sheet having opposite major surfaces;

at least partially bonding together the major surface of the second bonding sheet and the other major surface of the optical sheet such that the optical sheet is disposed between the first bonding sheet and the second bonding sheet.

5 37. The method of Claim 36 wherein said trimming comprises forming the slit through the optical sheet and through the first bonding sheet or the second bonding sheet.

38. The method of Claim 36 further comprising:

providing two transparent glazing components, each of the glazing components having a major surface and a peripheral edge;

positioning together the major surface of each of the glazing components with the other major surface of one or the other of the first and second bonding sheets, such that the optical sheet and the peripheral strip are disposed between the first and second bonding sheets and the first and second bonding sheets are disposed between the glazing components.

39. The method of Claim 38 further comprising:

at least partially bonding together the other major surface of the optical sheet and the one major surface of the second bonding sheet, at least partially bonding together the other major surface of the first bonding sheet and the major surface of the one glazing component, and at least partially bonding together the other major surface of the second bonding sheet and the major surface of the other glazing component,

wherein the optical sheet is bonded between the first and second bonding sheets and the first and second bonding sheets are bonded between the glazing components.

40. The method of Claim 38 further comprising:

applying heat and pressure for a sufficient time to allow the major surfaces of the first and second bonding sheets to flow and sufficiently bond to the respective major surfaces of the optical sheet and the glazing components.

41. The method of Claim 38 further comprising:
applying at least heat for a sufficient time to allow a gap between the peripheral strip and the optical sheet to substantially fill with a portion of at least one of the first and the second bonding sheets.

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42. A method of making a laminate for use in a window structure comprising:
providing two bonding sheets and a transparent optical sheet, each having two major surfaces and a peripheral edge, and two transparent glazing components, each having a major surface and a peripheral edge, with the optical sheet comprising a non-metallic multi-layer optical film having a peripheral edge;

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dimensioning the optical sheet so that the peripheral edge of at least one of the glazing components is positionable substantially within the peripheral edge of the optical film;

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positioning one major surface of the optical sheet and one major surface of the first bonding sheet and positioning the other major surface of the optical sheet and one major surface of the second bonding sheet, such that the optical sheet is between the first and second bonding sheets;

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positioning the other major surface of the first bonding sheet and the major surface of one of the glazing components and positioning the other major surface of the second bonding sheet and the major surface of the other glazing component, such that the first and second bonding sheets are between the glazing components; and

positioning the optical sheet such that a substantial portion of the peripheral edge of the optical film lies beyond the peripheral edge of at least one of the glazing components; and

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bonding together each of the major surfaces of the bonding sheets with the respective major surfaces of the optical sheet and the glazing components.

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43. The method of Claim 42 wherein the peripheral edge of at least one of the glazing components is positioned within the peripheral edge of the optical film, and said method further comprises:

trimming at least that portion of the optical sheet that is located beyond the peripheral edge of the at least one glazing component such that the resulting peripheral

edge of the optical film is at least about flush with the peripheral edge of the at least one glazing component.

44. The method of Claim 42 wherein, before said bonding, the optical film is dimensioned so as to extend at least about 0.8 mm beyond the peripheral edge of at least one of the glazing components.

45. The method of Claim 42 wherein, before said bonding, the optical film is dimensioned so as to extend in the range of from about 0.8 mm to about 13 mm beyond the peripheral edge of at least one of the glazing components.

10 46. A kit for making a laminate, said kit comprising:

15 a first bonding sheet having a major surface and a peripheral edge, said first bonding sheet being suitable for bonding to a glazing component having a major surface and a peripheral edge; and

20 a transparent optical sheet comprising a non-metallic multi-layer optical film, said optical sheet having a major surface and a peripheral edge, said optical film having a peripheral edge, and the major surface of said optical sheet and the major surface of said first bonding sheet being positionable together such that a substantial portion of the peripheral edge of said optical film lies within the peripheral edge of said first bonding sheet,

25 wherein said optical film is dimensioned so as to be positionable substantially within the peripheral edge of the glazing component to which said optical sheet is to be adhered.

30 47. The kit of Claim 46 wherein said optical sheet has another major surface and said laminate further comprises a second bonding sheet, said second bonding sheet having a major surface that is positionable relative to the other major surface of said optical sheet such that said optical sheet can be disposed between said first bonding sheet and said second bonding sheet.

48. The kit of Claim 47 further comprising two transparent glazing components, each
of said glazing components having a major surface and a peripheral edge, wherein each of
said first bonding sheet and said second bonding sheet has another major surface that is
positionable so as to face the major surface of one or the other of said glazing components
such that said optical sheet can be disposed between said first and second bonding sheets
and said first and second bonding sheets can be disposed between said glazing
components.